



Luxembourg Financial centre 2021 Climate Scenario Analysis An overview



Content

| | |
|--|---------------------------|
| 1. Introduction from the LSFI | 4 |
| 2. Foreword from 2DII | 5 |
| 3. Coordinating organisations | 7 |
| 4. An overview of the Luxembourg Analysis | 8 |
| 4.1 Objectives | 8 |
| 4.2 Target & Analysis Characteristics | 9 |
| 4.3 Methodology | 9 |
| <i>Pacta for Investors</i> | 12 |
| <i>Pacta for Banks</i> | 13 |
| 4.4 Organisational Aspects | 14 |
| 4.5 Content of the individual reports | 16 |
| 5. Timeline of the Luxembourg Analysis | 19 |
| 6. Participating Institutions | 21 |
| 6.1 Overall Participation | 21 |
| 6.2 Insights from Participating Institutions | 22 |
| 7. Next Steps | 36 |

1. Introduction from the LSFI

Action to combat climate change is urgently needed and should be taken at every level of our societies. However, to find the right solutions to any issue, it is first necessary to understand that issue in all its dimensions. Understanding does not mean accusing or trying to find a scapegoat. It just aims at facing the reality of the problem from an objective standpoint, to then find practical solution(s) to solve the problem.

Regarding climate change, everyone can, at different levels, try to understand and measure their impact to take the right remedial actions. At an individual level, you can measure your carbon footprint and act to reduce this carbon footprint where you can (e.g., consider working on the isolation of your house). Similarly, at a company level, it is also necessary to understand which one of your activities might contribute the most to climate change before taking any meaningful decisions to reduce this impact.

When looking at the financial sector, to understand this potential climate impact, it is necessary to look into where the money is invested and how much this invested money contributes to so-called «brown activities» (i.e., carbon-intensive activities). Creating the link between one unit of money invested and one unit of carbon emission from a company where that money is invested requires complex methodologies involving estimates/assumptions and statistical calculations.

Amongst existing methodologies, the LSFI chose the climate scenario analysis offered by the Paris Agreement Capital Transition (PACTA) methodology as developed by the not-for-profit think tank 2° Investing Initiative (2DII). This choice was motivated by the transparency and public availability of the methodology and by 2DII's extensive experience in proposing country wide climate scenario analysis for financial institutions (e.g. [Swiss report](#), [Austria Report](#), [Norway report](#), etc.).

The LSFI, in collaboration with the 2DII, launched in 2021 the Luxembourg 2021 Climate Scenario Analysis ("the Luxembourg Analysis"). With it, it offered to Luxembourg-based financial institutions a free and fully anonymised tool to run a first analysis of their loans (only for banks) and investment portfolios (for all types of institutions). The main objectives were to get them acquainted with such methodologies, help put the climate change topic on their agendas and help them anticipate future regulations, linked to Luxembourg and Europe's pledge to be climate neutral by 2050, which will require such measurements.

This document aims to give an overview of the process covering: the objectives ([page 8](#)), the background & targeted sectors ([page 9](#)), the PACTA methodology and the type of report provided to participants ([page 16](#)). It also includes feedback from participating companies ([page 22](#)). Considering the above-mentioned objectives, the analysis was fully anonymised and the LSFI did not receive any data regarding participating companies. Therefore, the LSFI cannot showcase an aggregate view of the results provided to participating companies.

2. Message from 2DII

At the time of writing this foreword, temperatures in Antarctica are 40°C higher than normal for this period of the year. 40°C higher. I urge you to take a moment and let that catastrophic number sink in. While I doubt that anyone reading these lines would need any extra convincing that climate change is already happening all around us – but if one does, let this be it.

But perhaps far more disconcerting is that we are nowhere near on track to stop climate change. The latest IPCC calculations show that we need to roughly halve our emissions by 2030, yet emissions are expected to rise by 16%. What's more, after a short dip of emissions in 2020 due to the COVID-19 pandemic, global annual emissions in 2021 rebounded to 36.3 billion tonnes, their highest level yet. Indeed, we find ourselves 50 years after the Club of Rome report, 30 years after the Rio Declaration on Environmental and Development, and 7 years after the Paris Agreement, yet we have never emitted more CO₂ into the atmosphere than we are now.

The only way for us to have a shot at stopping climate change is by decarbonising our economies rapidly, and the coming 8 years are absolutely crucial. The financial sector has an obvious and significant role to play as vast amounts of capital are needed to achieve the transition towards a low carbon world. It is therefore very commendable that the Luxembourg government, through the Luxembourg Sustainable Finance Initiative, offered to national financial institutions a free, open-source and fully anonymised alignment tool called PACTA to run a first analysis of Luxembourg loan and investments portfolios. This process has hopefully helped the financial institutions gain a deeper understanding of complex alignment-related questions and helped them anticipate future regulations, where alignment considerations are likely to be mandatory components. We are proud to have been able to play a humble role in this regard.

By running this exercise, Luxembourg is contributing to further international understanding of the alignment of financial flows with Paris Agreement Goals. Climate change doesn't stop at borders and international coordination is critical to help align financial flows with climate goals. Luxembourg joins governments from Switzerland, Norway, Liechtenstein, and Austria and as well as various financial supervisors across the globe that have been running PACTA at a systematic level – which means that beyond offering participants of this exercise insights on their portfolio's climate risks, projects like this offer countries the chance to have a structured dialogue on topics related to climate aligned finance with their financial sector.

But we must not stop there. Such actions can only be the first step in a longer sustainable finance journey. Getting climate change on the agenda of every financial institution is important, as well as helping them understand the pros and cons of various climate approaches. But all of this is only worthwhile if it leads to change in the real world: if it makes companies go greener faster; if it helps close the investment gap; if it accelerates the retirement of fossil assets; and if it helps governments and regulators keep track of how much progress we are making as a whole. Therefore, we very much hope that this Overview is the start of a longer journey for the LSFI and the Luxembourg financial sector in contributing to the Paris Agreement.

We ourselves will continue to conduct cutting edge research on alignment considerations and implement new features and analytics into the open source PACTA tool. We hope that our upgrades ensure users have significantly more company-level alignment results and can directly take action, tracking performance over time against their own targets and independent net-zero targets, and linking alignment to real world impact by integrating the tracking of physical fossil assets on the ground. All in all, with the next round of upgrades of PACTA, we hope to continue to offering an independent tool to the market that helps us move to the next part of the sustainable finance journey: actively contributing to lowering greenhouse gas emissions.

Maarten Vleeschhouwer

Head of PACTA at 2DII

3. Coordinating Organisations

The Luxembourg 2021 Climate Scenario Analysis (The Luxembourg Analysis) has been coordinated and developed by the 2 Degrees Investing Initiative (2DII) and the Luxembourg Sustainable Finance Initiative (LSFI).

The Luxembourg Analysis was twofold:

- PACTA for Investors was proposed to all financial institutions to assess investment portfolios.
- PACTA for Banks was proposed to banks to assess their loan books ([see page 9](#)) for more details on these two different modules).

2DII is an international, non-profit think tank working to align financial markets and regulations with the Paris Agreement goals. The Luxembourg project was led by Catarina Braga at 2DII, who took care of the coordination and organisation of the analysis, while also providing one-to-one technical and knowledge assistance to participants. She was supported by George Harris, who provided technical guidance and expertise for the module dedicated to banks. Maarten Vleeschhouwer (Head of PACTA), Jakub Červenka and Souad Koliaï also played a crucial role in the development of the Luxembourg Analysis.

Contact email: pactacop@2degrees-investing.org

Website: www.2degrees-investing.org

The development of the PACTA methodology and software infrastructure has received funding from the European Union's Life program under grant agreement LIFE19/NGO/SGA/DE/00040, as well as from the Government of Luxembourg.

The LSFI is a non-profit association that raises awareness, promotes and helps develop sustainable finance initiatives in Luxembourg. It also designs and implements the Sustainable Finance Strategy for the Luxembourg financial centre. Nicoletta Centofanti, LSFI's Sustainability Adviser, supported the Luxembourg Analysis. Her main role was to liaise with the financial industry, to present and discuss the whole project, and to ensure smooth communication and coordination between the financial industry and 2DII's team.

Contact email: info@lsfi.lu

Website: www.lsfi.lu

4. An overview of the Luxembourg Analysis

A Luxembourg wide climate scenario analysis to support the transition of financial institutions.

4.1 Objectives

Anticipating regulatory requirements, developing a «climate» culture and training relevant staff

The European Union has been working on a set of regulations to redirect financial flows towards climate and environmentally sustainable activities. These regulations (including the so-called «Disclosure» regulation, the environmental «Taxonomy», the review of the benchmark regulation and of the Non-Financial Reporting Directive) are now coming into force and are deeply impacting the way financial institutions consider climate/environmental issues in their everyday work.

To support the financial sector in integrating climate related considerations as will be required by the upcoming regulations, and to help them understand to what extent their investment portfolios are aligned with the Paris Agreement's objectives, the LSFI launched in 2021 a country-wide "climate scenario analysis" of Luxembourg's financial sector.

Launching the Luxembourg Analysis was a way to put the climate topic at the centre of the Luxembourg financial sector's agenda, especially of the participating institutions. More specifically, running the analysis was an opportunity for participating institutions to organise informative/awareness raising sessions on the climate crisis topic and its link with the financial industry. It was also a practical training for relevant staff (e.g., risk analysts) involved in the analysis to get familiar with climate scenario analysis: understanding, in practice, an existing methodology and the types of outputs that can be delivered and used to feed an institution's climate action.

Offer a measurement of where financial institutions stand

For financial institutions, climate scenario analysis is a way to understand how resilient and flexible their portfolios are considering a range of plausible climate future states. This information is necessary for them to make relevant decisions to ensure this alignment in the future.

A country-wide analysis, such as the Luxembourg Analysis, also aims to provide participating institutions with a report which allows an anonymised comparison to their peers.

PACTA at a glance

The Paris Agreement Capital Transition Assessment (PACTA) is a free and open-source methodology and software tool developed by the 2° Investing Initiative (2DII) to assess the alignment of investor and bank portfolios with climate goals. PACTA enables financial institutions to measure the alignment of their portfolios with climate scenarios across a set of climate critical sectors and technologies.

At its core, PACTA compares what needs to happen in sectoral decarbonization pathways with financial actors' exposures to companies in those sectors. PACTA provides a five-year forward-looking, bottom-up analysis. The analysis looks at the investment and production plans of companies, which is based on physical asset-based company data, and consolidates that information to identify the energy transition profile of the companies and their related financial instruments. This information is aggregated at the portfolio level and compared to the production plans projected in different climate scenarios.

The PACTA methodology covers seven of the most carbon-intensive sectors in the economy (i.e., the sectors most exposed to transition risks) – oil and gas, coal, power, automotive, cement, aviation, and steel (the "PACTA sectors"). Together, they are responsible for ~75% of all CO₂ emissions. In each sector, PACTA focuses on the part of their value chain with the highest contribution in terms of CO₂ emissions. For example, in the oil and gas sector, the focus is on upstream activities related to production, while in the power sector the focus is on power generation.

In practice, PACTA measures alignment in three concrete steps:

1. Connecting the forward-looking productions plans of companies to decarbonization pathways.
2. Calculating the alignment results on the company level.
3. Allocating company-level alignment results to the portfolio.

PACTA measures the alignment of listed equities, corporate bonds, and corporate lendings, assessing their exposure to climate-relevant sectors².

In Luxembourg, the analysis itself consisted of two exercises:

- “PACTA for Investors”, the analysis of listed equities and corporate bonds’ investment portfolios, available for any financial institution.
- “PACTA for Banks”, the analysis of loan books, available for banks.

Even if the methodology applied is the same, due to the different nature of the assessed assets, the process applicable for PACTA for Investors varies greatly from the one used for PACTA for Banks.

Snapshot - About the PACTA methodology

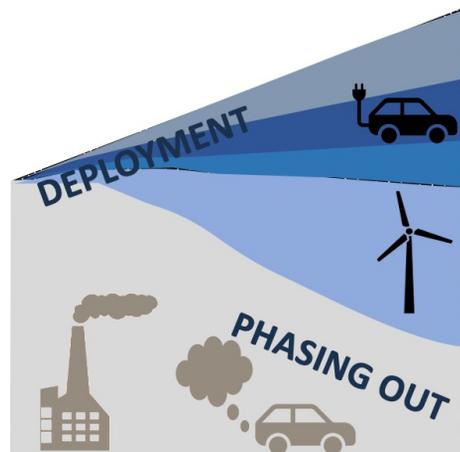


The Paris agreement aims to **limit global warming** well below 2°C

This objective can be translated into a **carbon budget**

Carbon budget is translated in **technology deployment road-maps** (notably by the IEA)

PACTA methodology compares these road-maps with **the assets and investment plans** of the companies present in each portfolio



Source: 2DII

A bank could participate in both PACTA for Investors to analyse investment portfolios and in PACTA for Banks to analyse loan books. However, depending on the nature of its business, its needs and available resources, a bank was also free to participate in only one of the two analyses.

² More information on **PACTA** methodology scope and parameter on [PACTA Knowledge Hub](#) website page.

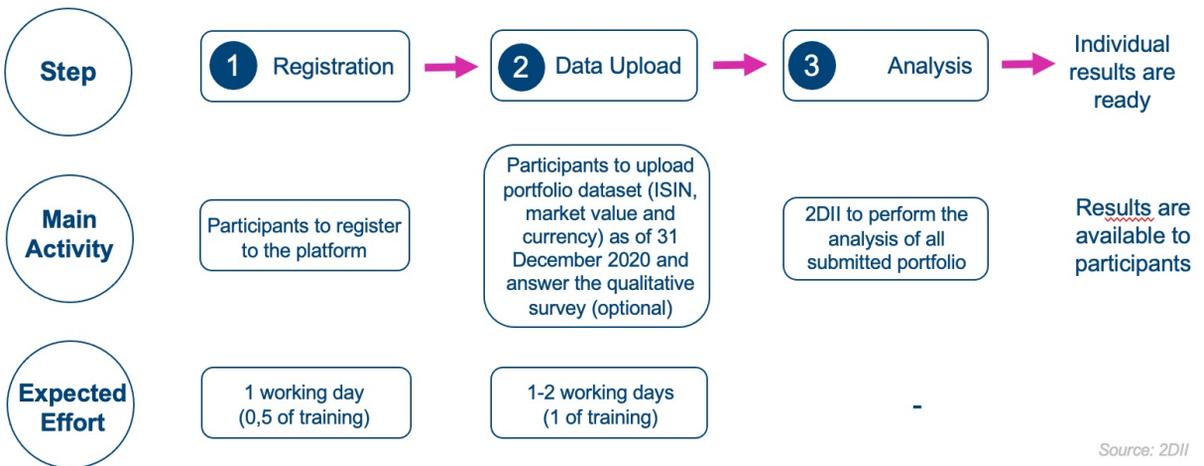
PACTA for Investors

Process description: Participating institutions were required to upload the requested data³ on the online dedicated platform “Transition Monitor” which is used to securely and confidentially transfer the assessed portfolio to 2DII. No other action was required from participating institutions. 2DII was then in charge of analysing the uploaded data and issuing individual reports to each participating institution. Once the analysis was completed, participants could access their individual results via the online platform.

Resources involved: A risk analyst was required to run the analysis: the employee had to collect and prepare the assessed data. A total workload of 2-3 working days was required.

The figure below shows the main project steps and the expected effort in terms of resources involved and how the PACTA methodology works in practice and the data sources.

PACTA for Investors Process



Source: 2DII

³ More details on PACTA for investors process and required data set on PACTA Knowledge Hub website page.

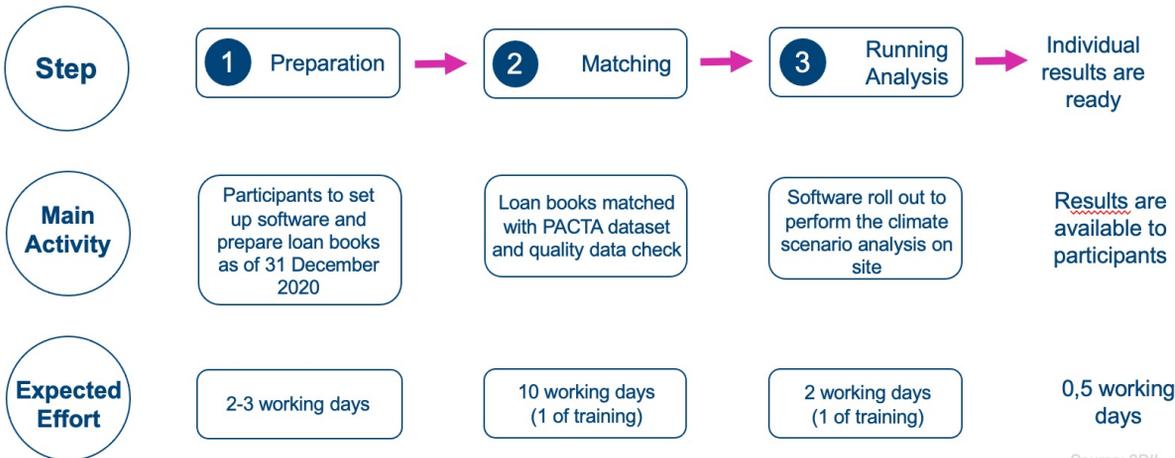
PACTA for Banks

Process description: due to regulatory constraints, participating institutions were required to perform the entire analysis in-house. In order to run the analysis⁴, participating banks had to download the necessary R-software package⁵ and prepare their loan books. Once the analysis was concluded, individual climate alignment results (i.e., the analysis based on the loan book data but excluding the loan book data as such) were submitted by e-mail to 2DII in order for 2DII to share to participants consolidated peer results for comparison purposes.

Resources involved: A risk analyst was required to run the analysis: the employee had to collect and prepare the data as per the 2DII format and perform the loan books assessment. A total workload of 10-12 working days was required. Banks also had to dedicate an IT R-code expert for about 2-3 working days to download and install the software package.

The figure below shows the main project steps and expected effort in terms of resources involved for PACTA for Banks.

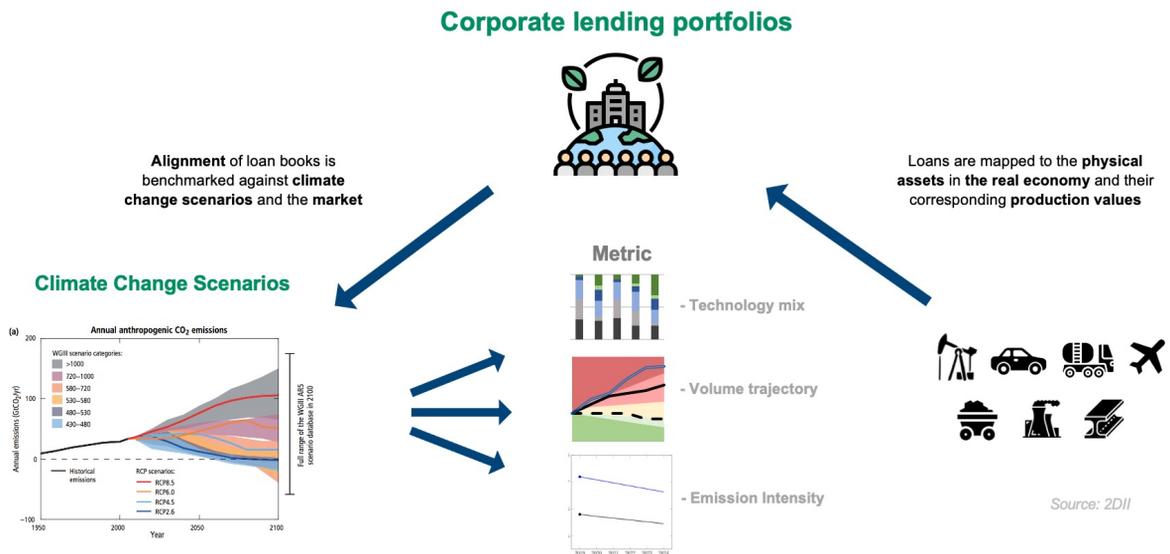
PACTA for Banks Process



⁴ More details on PACTA for investors process and required data set on PACTA Knowledge Hub website page.

⁵ More information on PACTA software package on [PACTA Transition monitor](#) website page.

The figure below shows an overview PACTA methodology for banks, indicating the scenarios, metrics and sectors analysed.



4.4 Organisational aspects of the Luxembourg Analysis

2DII and the LSFI were in charge of the coordination of the Luxembourg Analysis. Each of them had complementary roles.

The PACTA team of 2DII offered technical support (both in terms of knowledge and IT infrastructure) until the delivery of the individual reports to participating institutions:

- Dedicated online platform for PACTA for Investor: 2DII first created and ran a dedicated online platform for PACTA for Investors under the Luxembourg Analysis.
- Dedicated content: 2DII developed online informative documents (e.g., Q&A, methodology description, etc.) to explain the methodology and ensure it was applied correctly.

- Free technical training: dedicated webinars for the participating or interested institutions (e.g., webinars on the methodology, implementation processes and foreseen outcomes).
- Central point of contact/Helpdesk: 2DII also provided a point of contact available for questions and clarifications from any institutions participating or willing to participate.
- Final individual reports: 2DII was also in charge of delivering the final individual reports (more information can be found in [chapter 4.5](#)).

The LSFI:

- Promotion of the Luxembourg Analysis: the LSFI presented and promoted the exercise to the Luxembourg financial centre (e.g., organising presentations of the analysis to financial industry players introducing the objectives and main features of the exercise). A dedicated page on LSFI's website was also developed so that any interested institutions would be aware of the key milestones and contact persons.
- Coordination between the financial sector and 2DII: the LSFI was supporting 2DII in communicating to the participating institutions (e.g., reviewing emails, presentations, or other communication documents to ensure the right level of information was always provided to the participating institutions) and in organising the kick-off and the closing webinars.

More details about the project's process and the specific activities developed by the organising institutions can be found in [chapter 5](#).

4.5 Content of the individual reports

After taking part in the Luxembourg Analysis, the participating institutions received a confidential individual report showing the alignment of their financial portfolios to the Paris Agreement's goal.

The study was anonymous and confidential. Therefore, only the participating institutions have access to their own individual reports. The LSFI did not receive any data, neither at individual nor at aggregate level. However, these participating institutions are free to decide whether or not they want to disclose their participation and results.

After receiving their individual report, participating institutions were also able to organise a debriefing workshop with 2DII to better understand their results and understand what the next steps could be for them.

PACTA for Investors

By the end of the project, participating institutions received their results on the Transition Monitor Platform. The individual reports are interactive⁶ and allow the possibility of comparing the results with those from the peers (i.e., anonymised and aggregate results of other participating institutions).

The interactive individual report includes the following information:

- Sector coverage: financial sector split of the total investment in the selected asset class. It shows the exposure to companies with assets in climate-relevant sectors.
- Technology mix: percentage of the portfolio in climate relevant sectors and technologies.
- Geographic exposure: information about the geographical location of each asset.
- Alignment of production trajectories: indication of the required change of production according to different climate scenarios.
- Future technology breakdown: split between technologies in each sector expected within the portfolio in 5 years and how it would be if the companies in the portfolio were to align with the scenario.
- Alignment of emission intensities: emission intensity expected development over the next five years based on the plans of the company and what would be expected under the selected scenario.

⁶ Example of PACTA interactive individual report is available on 2DII [website page](#).

- Company low-carbon split: combination of current technology mix and alignment information for all invested companies in the chosen sector.
- Example of PACTA interactive individual report is available on 2DII [website page](#).
- Company technology exposure: breakdown of each company's production capacity in each sector by technology and comparison to the portfolio, the peers and this portfolio if they were to be aligned with the selected scenario.
- Peer comparison High-carbon exposure: comparison of the share of high-carbon technologies across the portfolios inside one peer group.
- Peer comparison low-carbon exposure: comparison of portfolios exposures to low-carbon technologies.

Climate stress test⁷ scenarios based on PACTA results have been developed by 2DII and are available for participating institutions to measure for the assessed portfolio(s):

1. What are the potential financial losses under certain climate scenarios
2. How are these potential financial losses distributed across different technologies and sectors?

To assist in planning the next steps and support participating institution in achieving impact in the real economy, 2DII has developed a Climate Action Guide⁸ and the Climate Impact Management System for Financial Institutions⁹. The Climate Action Guide provides information on climate actions that can be taken and summarises the current evidence that links these climate actions with CO2 reductions. It also can be used to simulate the implementation of climate actions and what effect these would have on your portfolio. On the other hand, the Climate Impact Management System for Financial Institutions aims to provide financial institutions with a complete framework to design scientifically sound climate contribution strategies.

The framework can be applied at the product, business line, or institutional level. While it is primarily designed for financial institutions, it can also inform the development of labelling or certification schemes for financial products. Financial institutions in Luxembourg were given the possibility of support to implement the system once they received their PACTA results.

⁷ PACTA Climate stress test methodology and output are available on [2DII website page](#).

⁸ The Climate Action Guide can be accessed only by participating institutions on the [website](#) where individual results are displayed (subscription required).

⁹ Making a Real Impact: the [Climate Impact Management System](#) for Financial Institutions

PACTA for Banks

Once the analysis is completed, participating institutions generated an in-house offline individual report in excel-format. This can be run with a plotting package to create graphical representations of the results, including the following figures:

- Technology mix: approximation of the bank's relative exposure to the economic activities that are impacted by the transition to a low-carbon economy.
- Production volume trajectory: comparison of the portfolio's volume production trend against the trends set as targets from climate scenarios.
- Emission intensity: display of the portfolio's loan weighted average emission intensity at present with a yearly target for the next 5 years based on the asset-based company data using the SBTI's Sectoral Decarbonization Approach (SDA)¹⁰.

For participating institutions submitting their individual report to 2DII, a comparison with their peers was provided, as part of the coordinated Luxembourg Analysis.

PACTA methodology & individual reports next steps

PACTA can be used by various interested parties with different goals, however, financial institutions can use PACTA results for:

- identifying and engaging with clients to improve on climate alignment;
- informing climate related decision making and strategy;
- informing risk management;
- disclosing and reporting on climate alignment, as part of implementing the recommendations from the Task Force on Climate-related Financial Disclosure (TCFD), as well as to comply with related regulations such as Article 173 of France's Law on Energy Transition for Green Growth and others;
- as an input to other climate finance metrics (e.g., stress testing).

¹⁰ Absolute carbon budgets are set for each sector and then converted to intensity targets per year for the market.

5. Timeline of the Luxembourg Analysis

The Luxembourg Analysis was kicked off with a launch webinar on 28 June 2021. Representatives of the Ministry of Finance and the Ministry of the Environment, Climate and Sustainable Development participated to highlight the importance of such a Luxembourg wide analysis and encourage the financial industry to participate. 2DII explained the PACTA methodology and, finally, the LSFI outlined the timeline and the key objectives.

PACTA for Banks and PACTA for Investor (see [page 12](#) to understand the difference between the 2 types of analysis) followed different timelines based on their own specific technicalities.

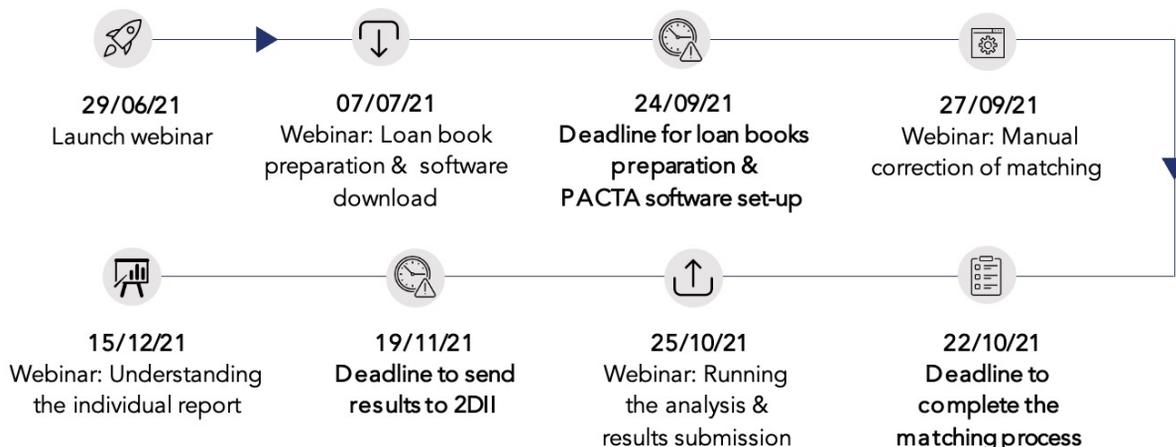
PACTA for Banks - timeline

PACTA for banks lasted about six months from the date of the launch webinar until the day when the participating banks received their results (June 2021 to December 2021). Due to the particularities of the asset analysed (loan books) and regulatory constraints, this analysis had to be performed in-house and was more complex and resource-intensive (see [page 13](#) for more information). Therefore, PACTA for Banks required extensive training and guidance from the 2DII team during the whole process. Three practical webinars were organised to explain the 3 main steps of the analysis:

1. how to prepare the loan books and how to download the code which would perform the analysis;
2. how to match the loan books with the asset level data and correct possible issues;
3. how to run the analysis using the above-mentioned code.

A detailed timeline of the project can be found below, including the main webinars held as well as the deadline that participants needed to follow throughout the process.

PACTA for Banks Timeline



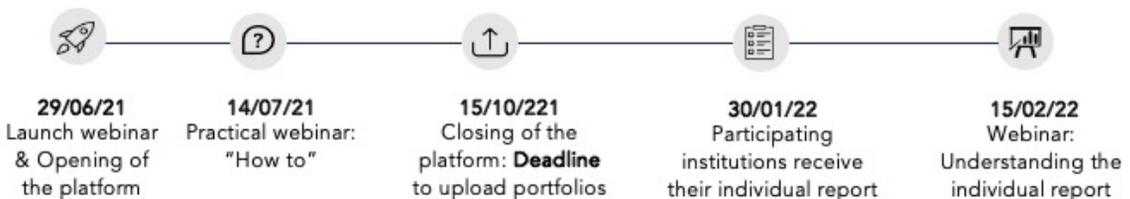
PACTA for Investors - timeline

PACTA for Investors lasted around seven months. As explained in the methodology chapter, this analysis covers investment portfolios which had to be uploaded by participating institutions onto a dedicated platform developed by 2DII. The process was less resources intensive than PACTA for Banks.

A few weeks after the Luxembourg Analysis was launched, the 2DII team organised a practical webinar for interested institutions to explain how to use the dedicated platform and how to collect the investment portfolios data to fit the platform requirements. From then on, the participating institutions had three months to gather and upload their portfolios on the platform. This was followed by a two-month period during when 2DII analysed the information, prepared and delivered the individual report to each participating institution.

A detailed timeline of the project can be found below, containing the main activities and deadlines carried out throughout the project.

PACTA for Investors Timeline



Two closing webinars were organised (one for PACTA for Banks and one for PACTA for Investors) to explain to participating institutions the analysis results as shown in their individual reports and how to follow up on them. Both webinars were open by the Luxembourg Ministry of Finance and Ministry of the Environment, Climate and Sustainable Development to reiterate their strong support for the Luxembourg Analysis. The LSFI closed both sessions with information about its follow up plans for 2022 building on this first exercise. **These two closing webinars were open to both participating institutions and other institutions that mentioned their interest in the analysis.**

6. Participating institutions

6.1 Overall Participation

This study covered a total of 52 Luxembourg-based financial institutions:

- **48** participated in the PACTA for Investors analysis accounting for approximately 4.957,3bn USD in assets. Various types of institutions took part in the analysis, as shown in the figure below.
- **4** banks participated in the PACTA for Banks analysis.

The table below shows further details regarding PACTA for Investors, such as the AUM analysed

| Participating Institutions by peer group | Tot. number of participating Institutions ¹ | Tot. AuM - bonds/equity ² | Tot. AUM - climate relevant sectors |
|---|---|---|--|
| Asset Managers | 15 | USD 610.388.046.822 | USD 73.998.171.369 |
| Banks | 11 | USD 186.681.198.729 | USD 17.315.789.967 |
| Insurance Companies | 19 | USD 64.793.761.456 | USD 8.238.887.161 |
| Service Providers | 3 | USD 4.095.452.785.399 | USD 687.542.266.324 |
| Total | 48 | USD 4.957.315.792.407 | USD 787.095.114.821 |

1. Participating institutions, submitting their portfolios into the platform.
2. Final valid data assessed via the PACTA platform, verified by 2DII data quality assurance.

6.2 Insights from participating Institutions

Aiming to understand the experience of participating institutions, the LSFI launched an anonymous survey among the financial sector organisations after closing the Luxembourg analysis. The aim was to understand the main challenges experienced for those participating in PACTA, the added value, and the outcomes triggered. This survey was complemented by four interviews with financial institutions that agreed to disclose their participation and share their experience. Both the survey and the interviews were extremely valuable for 2DII and the LSFI to better understand the perceptions of the financial sector regarding the process of the analysis, its results, its usefulness and where improvements could be needed.

This chapter provides the main findings from these interviews and the survey responses and is divided into the following four main themes:

- Why participating in a climate scenario analysis?
- How is the process of Performing PACTA? PACTA for Banks vs. PACTA for Investors.
- What were the actions triggered, the gaps identified and the solutions?
- Where do the Luxembourg financial institutions stand?

The LSFI team would like to thank those who shared their knowledge and experience through the survey and interviews and will make sure all lessons learned will be taken into account for future exercises. The feedback regarding the PACTA methodology has been also shared with the 2DII team.

Why participating in a climate scenario analysis?

Motivations to take part

Considering the uprise of sustainable finance (e.g., regulatory requirements and increased demand from investors), having an overview of a portfolio climate alignment was considered a key action by the LSFI. This type of exercise can be a way to decide on next steps and *in fine* advance the transition towards a more sustainable financial system.

For most interviewees, regulation was one of the main drivers to participate in the Luxembourg Analysis. They also highlighted that their individual results helped them understand how to be more aligned with the Paris Agreement and prepare for upcoming stress tests. There was also an expectation of getting more mature on the topic as for some interviewees it was the first time such an analysis was performed.

"There was both curiosity and the expectation to upskill and to understand the issues and challenges that we will have to face. It was also a way to respond to our obligations on our risk projects and to understand where we stand."

(Banque Internationale à Luxembourg)

In addition, with ESG strategies ramping up, it was also a way to gain insights into the actual effect of implementing these ESG criteria in investment portfolios.

"We had a new ESG strategy for our investment portfolio, and we wanted to see what the result of PACTA was. It was a strategic decision."

(Luxembourg Stock Exchange)

What has it brought: matched expectations?

According to the survey responses, the main positive effects from participating in this exercise are upskilling the staff (25%) and raising awareness within the organisation about the need to transition (21%). The interviews confirmed this point; this exercise required the participation of different teams within the organization, such as project managers, asset managers, risk team, finance team or IT:

"In our case, the strategy, the risk, the data, the sustainability and the asset management teams were involved."

(Banque Internationale à Luxembourg)

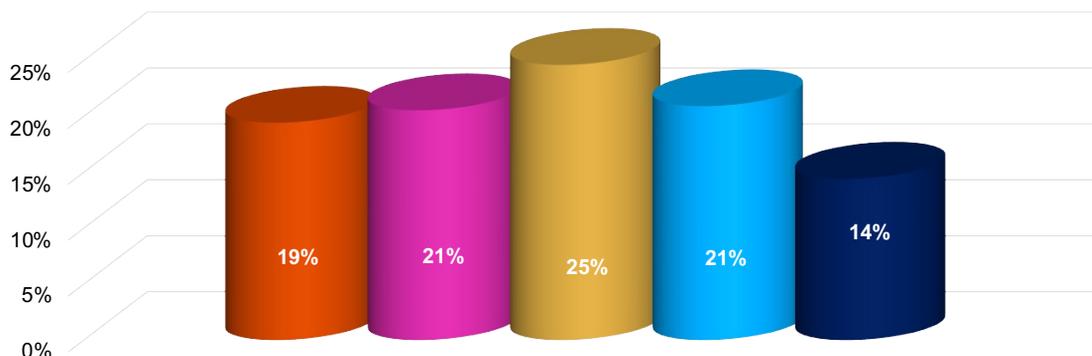
Besides, 19% of the survey respondents pointed out that understanding the overall Paris goals' alignment of their loan books or investment portfolios was a piece of knowledge that they did not have and that helped them reconsider specific investment strategies. For others (21%), it provided an understanding of which CO2 emission intensive sectors they were contributing to the most and upskilling their staff (e.g. regarding sustainable finance in general or climate scenario analysis).

"To determine the transition risk, PACTA is a really good tool. Besides, some graphics show how we stand today and how we should stand if the portfolio was aligned. This is useful and we could use it actively to swift position or invest more in companies which do more to reach the alignment."

(Spuerkees)

Another added value that the interviewees brought up is the peer comparison. This is a unique advantage from performing a coordinated exercise and it allows participating institutions to know where they stand compared to other Luxembourgish peers.

What is the (most significant) added value of having performed the Climate Scenario Analysis?



- Understanding the overall Paris goals' alignment of our loan books/portfolios, we did not previously have this knowledge.
- Understanding to which sectors we are contributing the most, we did not have this knowledge previously.
- Upskilling our staff (e.g. regarding sustainable finance in general or climate scenario analysis).
- Raising awareness within the company about the need to transition and take sustainability into account.
- None, we only participated to contribute to the Luxembourg exercise as we already knew the data or insights provided.

However, during the interviews, participants also pointed out a few flaws in the exercise. Major concerns were mainly associated with the sectors and the assets analysed by the methodology, as well as with the granularity of the results. It is a fact that the PACTA methodology analyses a limited number of asset types and sectors due to technical constraints (e.g., data availability is optimised for corporate bonds and public equities only) and methodological constraints (e.g., to avoid double-counting issue, the climate scenario methodologies need to focus on a limited number of highly emissive in the primary industry).

These limitations are true for any climate scenario analysis methodology (refer to the methodology for more details, [page 9](#)). Therefore, for some participating institutions the results were perceived as interesting but representative of a limited portion of their overall portfolio. This also applies to the granularity of the results: some interviewees pointed out that the added value would be higher if there were more results per assets and further information on transition and physical risks. Finally, the cut-off date chosen for the analysed portfolios (31 December 2020) was also considered as a limit for some of the interviewees.

Indeed, the topic is fast evolving and some of them had applied actions after the cut-off date that could therefore not be measured.

"I think it was difficult to assess what would be the scope of PACTA and what would be the share of our portfolio covered by the tool. At the end, only a minority of our portfolio was covered as some financial instruments, for example, sovereign bonds, were de facto out of scope."

(Luxembourg Stock Exchange)

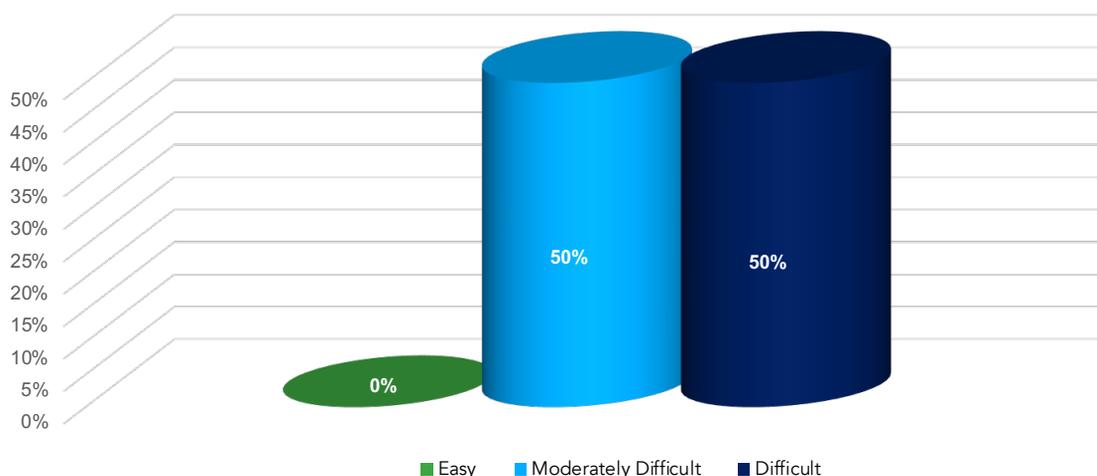
How is the process of Performing PACTA? PACTA for Banks vs. PACTA for Investors.

As described in [chapter 5](#), performing PACTA requires human resources, specific training and technical support. However, both the survey and the interviews confirmed that the difficulty and resources needed greatly varies between PACTA for Banks and PACTA for investors.

PACTA for Banks

100% of the survey respondents considered PACTA for Banks moderately difficult or difficult to perform.

How would you rate the technical easiness to perform the Climate Scenario Analysis?



This result is no surprise as PACTA for Banks needs to be entirely run internally (due to regulatory constraints). The participating banks needed to understand and install the provided software (R-package) and perform the analysis on-site. This was seen as challenging and time-consuming for participating banks. Different teams, such as IT, sustainability, or finance team, had to be involved and trained.

"The program we had to use was one we do not have within the bank. We would recommend changing the modus operandi in this case to facilitate the process."

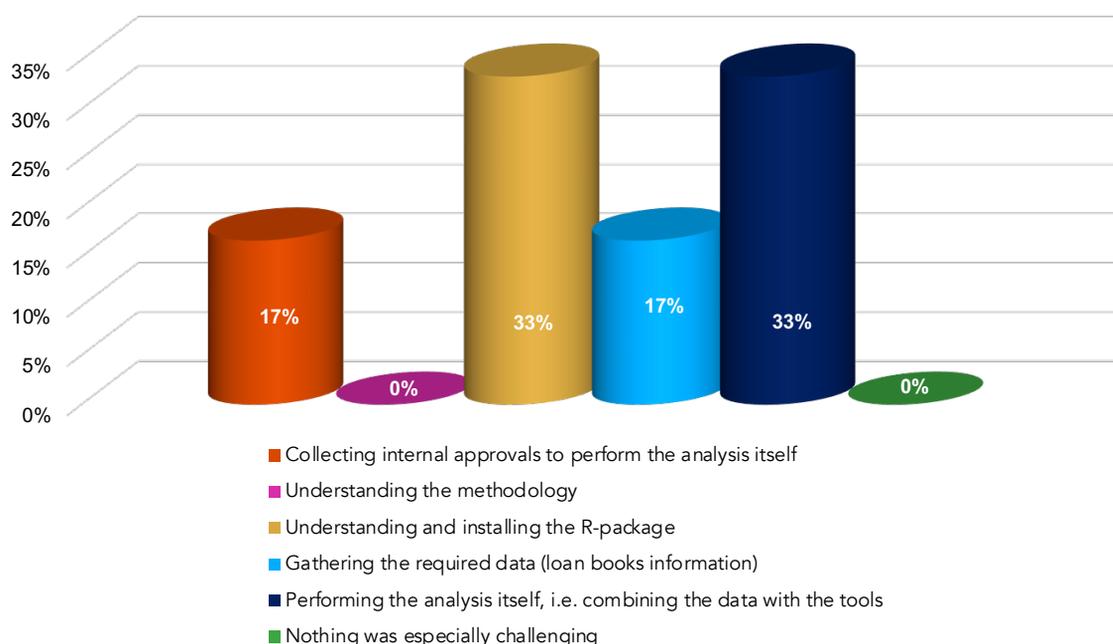
(Banque Internationale à Luxembourg)

More specifically, most participants (33% of survey respondents) found that performing the analysis itself, and not just installing the software, was difficult (i.e., combining the data -loan books- with the tools provided -R code-).

"The hardest part was the mapping exercise, it was complicated to match all the names of the products we were analysing with those provided by the tool, unfortunately, they were not always matching."

(Spuerkeess)

What was the most challenging activity that you experienced when running the exercise?



To support participating banks during the whole process and overcome the challenges, the 2DII team provided several training and explanatory webinars. According to the survey, these are considered key by the participants to be able to perform the exercise. However, most of them also advise additional actions to ensure that the analysis is easier to perform in a next occasion, such as: providing updates in the future when a new R package version is released, adapting the approach to the size of the bank, or improving the mapping methodology.

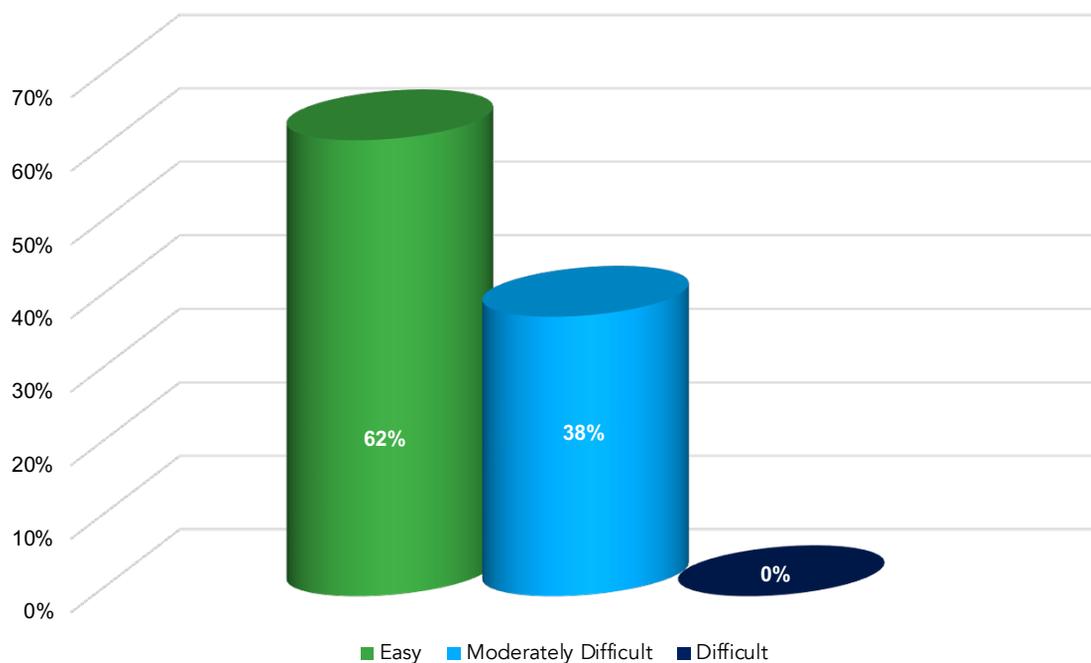
PACTA for Investors

On the other hand, for those performing PACTA for Investors the process was straightforward from a technical point of view.

"We did not experience any technical issue, and we could easily find all the data needed. We were also interested in getting acquainted with this methodology and be able to compare it to others."

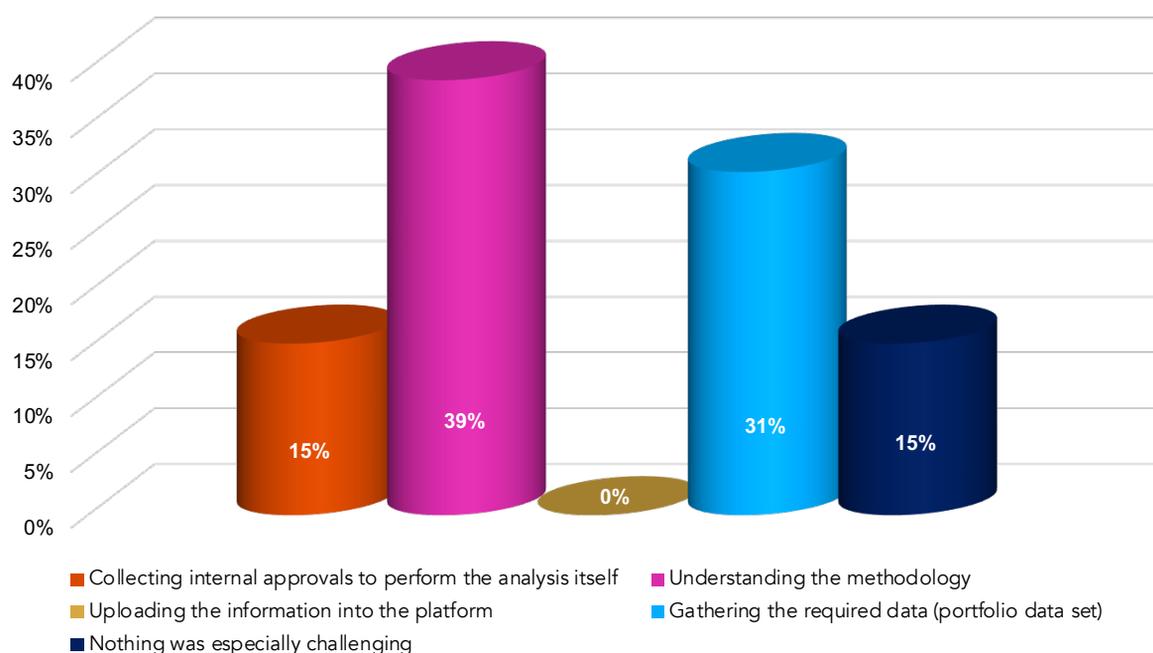
(Société Générale Private Wealth Management)

How would you rate the technical easiness to perform the Climate Scenario Analysis?



The survey results show that the most significant challenges identified by the participating institutions were understanding the methodology (39%) and gathering the required data (31%). Interviewees mentioned also that the use of the different scenarios and the sectors covered could be better explained.

What was the most challenging activity that you experienced when running the exercise?



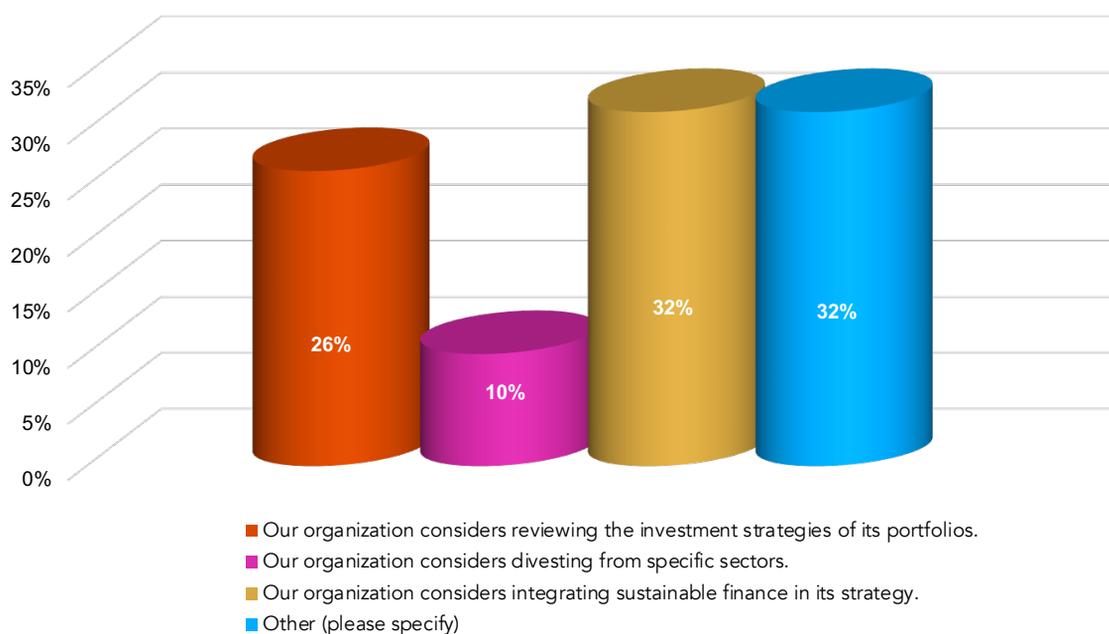
However, the webinars organised by 2DII and the documents provided (e.g., presentations, Q&A, etc.) were handy tools to guide them through the process as indicated by most participants on the survey.

What were the actions triggered, the gaps identified and the solutions?

Actions triggered

The outcome of the Luxembourg Analysis seems to have triggered some actions for some participating institutions. The survey highlights that some participants that did not yet have an ESG investment strategy will now, thanks to the analysis, take into account sustainable finance within their strategy (32%). Other respondents consider that it helped their organisation review the investment strategies of their portfolios (26%), finally, for some it was a way to consider divesting from some sectors (10%). For other participants that already had ESG investment strategies in place and sustainable finance strategies governing their institutions, the study did not trigger any specific action, but it is a step forward within their overall efforts and gave them a concrete tool. Finally, some interviewees highlighted that it was a complementary exercise to other methodologies used, helping them compare and have additional data.

Has the Climate Scenario Analysis led to any of the following actions/consideration within your organization?



Identified Challenges

Despite the momentum on sustainable finance and positive actions triggered by the Luxembourg Analysis to advance on this matter, all the interviewees pointed out that there are challenges they are currently facing and that those should be addressed.

One of the commonly identified issues is the change of mindset which is needed in this field both at staff and client level. This is related to another key challenge identified: the new skills that are required and, therefore, the training that has to be provided to the personnel.

In some cases, the shift in mentality started at a small level in dedicated teams, sometimes triggered by the regulatory pressure, but also with a strong sponsorship from the top management. However, training at the company level is ongoing and, in most cases, still needs to be fully implemented throughout the whole organisation.

"There is a willingness to transition but not everybody has understood how impacting and transformational this is. I don't think that globally we have the view on what is coming upon us, on the size of it."

(Banque Internationale à Luxembourg)

Some interviewees highlighted the fact that this difficulty is also clear at the client level. The sustainable impact of the investment does not seem to be the priority yet of most clients. However, change is looming:

“There are some clients who are interested in the sustainable aspects while others are not yet. However, we are starting to have interesting discussions with them on this matter. In addition, we must educate the clients to ensure they have a good comprehension of the sustainability issues, especially taking into account that we will need to start asking for their ESG preferences.”

(Société Générale Private Wealth Management)

Another major challenge is related to data availability, which poses a struggle for some, especially to comply with the new regulatory requirements. Some interviewees pointed out that the lack of standardised data, as well as unique and harmonised databases both among different teams within an organisation and also among data providers is an issue.

“An important and classic limit is the data quality and availability: this is a huge problem even for ESG data providers.”

(Spuerkeess)

Suggested Solutions

Participants were asked to suggest tools and actions in order to develop solutions to those challenges. One of the proposed actions is relatively straightforward: providing training on sustainable finance (29% survey responses). Some interviewees mentioned that they have already started to provide such training at company level, with dedicated courses for teams working on the topic or dealing with clients. Others explained that they are foreseeing broader training on sustainable finance across the whole organisation, with the idea to embed a new corporate culture taking into account sustainability at every level.

Regulation and providing guidance were identified as a key solution to transition too, even though the EU implementation calendar is tight and there is a lack of mature and available data. The survey participants therefore pointed out that they would like to have regulatory guidance to better navigate this regulatory landscape (24%).

“Regulation has always proved to be a great incentive for taking action. Regulation has to decide on what to do with those sectors that are unwilling to transition or do not have clear and ambitious transition plans. In addition, for a neutral marketplace like ours, it is important that these important decisions come from Regulation.”

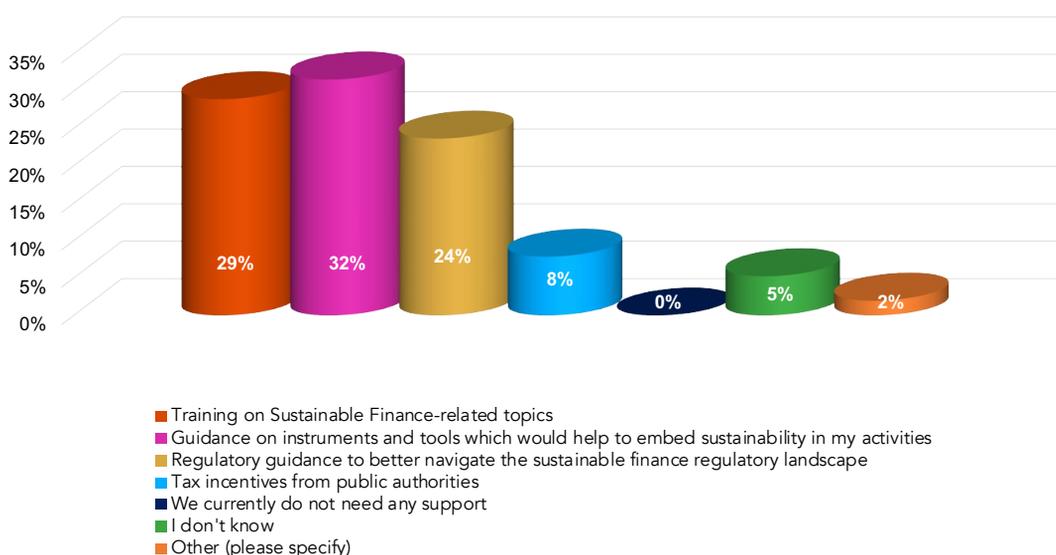
(Luxembourg Stock Exchange)

Finally, the highest request resulting from the survey was to receive guidance on instruments and tools which would help embed sustainability in their activities (32%).

“We would also like to have common initiatives in Luxembourg (data collection, common database...), everything that could be done on a national level. This would allow small banks like us to benefit from economies of scale.”

(Banque Internationale à Luxembourg)

If your organization is interested in sustainable finance, which type of support would be useful to embark on or reinforce your sustainability journey?



Where do the Luxembourg financial institutions stand?

While the level of maturity differs from one financial institution to another, sustainable finance is on the agenda of all the participating institutions interviewed. In most cases, this is a process they have embarked on a few years ago with the creation of sustainability committees, the implementation of sustainability strategies across the organisation, the development of specific products, the implementation of new investment strategies or the deployment of training for their employees. Performing a climate scenario analysis was an addition to these and a way to better understand where they stand.

Sustainable finance within the participating institutions at a glance:

"We have a programme called "towards sustainability programme" and since its launch, we begun 40 initiatives: we have regulatory projects, and we also have a project in changing our non-financial reporting. The programme can be divided in 4 pillars, the first one is having a strategy and a governance around the ESG. We also decided to sign the Principles for Responsible Business and the UN Global Compact to make our commitments more complete and concrete and gain access to methodologies to make assessments about impact and define targets."



Alessandra Simonelli
Group Head of Sustainability
Banque Internationale à Luxembourg



Laetitia Hamon
Head of Sustainable Finance

Luxembourg Stock Exchange

“Sustainable finance is undoubtable a priority for the Luxembourg Stock Exchange. We can divide our activities into two: LGX and the LuxSE. On the LGX side we are going in the direction of diversifying our activities: we are a displaying platform of sustainable instruments and we have extended this to the academy and to the data hub. We are also developing some assistance services and we plan to professionalize that so that we can help cover some gaps that we identified in the market. On the LuxSE side, we realized that we have to better understand our exposure and impact and PACTA is one of the elements for this.”

“We consider that it is our fiduciary duty to include sustainability aspects in our portfolio management because it protects the client portfolio, and it is an opportunity to get better visibility on the potential upside. We accelerate integrating sustainability aspects into our portfolio management and already half of our UCITS funds are classified as Article 8 or 9 and labelled by ESG labels by Luxflag, Label ISR or Greenfin.”



Petra Besson Fencikova, CFA
Head of ESG Investments

*Société Générale Private
Wealth Management*



Sara Palmirotta
Staff Member - General Secretariat

Spuerkees

"We have signed the Net-Zero Alliance and the Principle for Responsible Banking. We also have dedicated products in the retail domain that aim to reduce the carbon intensity of our customers. With regard to the investment strategies, at the moment we have an exclusion policy, meaning we have controversial policies and also sectoral exclusions with the most climate relevant sector. We are also working on the carbon intensity as this is something we need for the Net- Zero Banking Alliance that we are part of. From an organizational point of view, one and half year ago we created a sustainability committee which reunites all the departments."

7. Next steps

The LSFI's general mission is to promote all dimensions of sustainable finance - the climate crisis being one of them. This first exercise has been a great opportunity to create strong links with pioneering financial institutions willing to go a step further with regard to analysing their impact on climate and the impact of climate on their business.

Building on this, the LSFI will launch in 2022 a Climate Measurement and Reporting Working Group to lead the future works of the LSFI on this pressing issue.

The working group will be mandated with the general task to develop new climate related initiatives to push help promote and push this topic within the Luxembourg financial sector.

The working group will regularly report to LSFI's Board and to LSFI's Stakeholder Assembly (i.e. representatives of the Luxembourg core financial industry, the Luxembourg civil society, and the Luxembourg innovation, education and research sectors). The output of this working group will be made publicly available at relevant events and will also be included in LSFI's annual report.



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